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L3: Entry 1 of 1

File: USPT

Jun 2, 1998

DOCUMENT-IDENTIFIER: US 5759631 A

TITLE: Coating composition based on a hydroxyl group-containing polyacrylate resin and its use in processes for producing a multicoat finish

US PATENT NO. (1):5759631Brief Summary Text (11):

The present invention also relates to processes for producing a multilayer protective and/or decorative coating on a substrate surface and to the use of the coating compositions in the sector of automotive refinishing.

Brief Summary Text (14):

The object of the present invention was therefore to provide coating compositions which, when used as a transparent topcoat over a pigmented basecoat, lead to coatings having an adhesion to the clearcoat which is improved relative to the coating compositions known from JP-A 4-1254. At the same time, the resulting coatings should be of good chemical resistance and good weathering resistance. In addition, the coating compositions should be suitable for automotive refinishing, i.e. they should be able to be cured fully at low temperatures of in general below 120.degree. C., preferably below 80.degree. C. Furthermore, the coating compositions should also reach full cure rapidly at these low temperatures (rapid dust dryness and freedom from tack, and rapid through-drying) while at the same time should be able to be processed for as long (pot life) as possible. Furthermore, the coating compositions should have a good topcoat appearance and, when used as clearcoat over a basecoat, should cause only minimal dissolution of the underlying basecoat and should exhibit a good light/dark effect when viewed at different angles. Finally, the coating compositions should exhibit very good leveling and should exhibit good application characteristics under the conditions of automotive refinishing.

Brief Summary Text (23):

The present invention also relates to a process for producing a multilayer coating on a substrate surface using these coating compositions, and to the use of the coating compositions in the sector of automotive refinishing.

Brief Summary Text (24):

It is surprising and was not foreseeable that the coating compositions according to the invention, when used as a transparent topcoat over a pigmented basecoat, exhibit a distinctly improved adhesion to the basecoat while at the same time having good chemical resistance and weathering resistance. A further advantage is that the coating compositions can be cured fully at low temperatures and thus can be employed for the sector of automotive refinishing. Even when the coating compositions are cured at these low temperatures, the coating compositions rapidly attain full cure, although at the same time are able to be processed for a long time. Furthermore, the coating compositions according to the invention have the advantage of a good topcoat appearance and exhibit, under the conditions of automotive refinishing, very good leveling and good application characteristics. Finally, when used as clearcoat over a basecoat, the coating compositions according to the invention have the advantage that they cause only minor dissolution of the basecoat and exert only a very small influence on the metallic effect.

Brief Summary Text (76):

These coating compositions are conventionally cured at room temperature or slightly elevated temperature, advantageously at temperatures below 100.degree. C. and preferably at temperatures below 80.degree. C. However, the coating compositions can also be cured under baking conditions, i.e. at temperatures of at least 100.degree. C. Suitable substrates are, in particular, metals and also wood, plastic, glass and the like. Owing to the short curing times and low curing temperatures, the coating compositions according to the invention are preferably used for automotive refinishing, the finishing of large vehicles and goods-vehicle bodies. However, depending on the crosslinking agent employed they can also be utilized for the production-line finishing of motor vehicles. Furthermore, they are particularly suitable as a clearcoat.

CLAIMS:

13. An automotive refinish coating composition comprising

(A) at least one hydroxyl group-containing polyacrylate resin obtained by polymerizing

(a) from 5 to 80% by weight of a cycloaliphatic ester of methacrylic acid and/or acrylic acid, or a mixture of such monomers,

(b) from 10 to 50% by weight of a hydroxyl group-containing alkyl ester of methacrylic acid and/or acrylic acid, or mixtures of such monomers,

(c) from 0 to 25% by weight of a hydroxyl group-containing, ethylenically unsaturated monomer which is different from (a) and (b), or a mixture of such monomers,

(d) from 5 to 80% by weight of an aliphatic ester of methacrylic and/or acrylic acid which is different from (a), (b) and (c), or a mixture of such monomers,

(e) from 0 to 40% by weight of an aromatic vinyl hydrocarbon which is different from (a), (b), (c) and (d), or a mixture of such monomers, and

(f) from 0 to 40% by weight of a further ethylenically unsaturated monomer which is different from (a), (b), (c), (d) and (e), or a mixture of such monomers,

and

(B) at least one crosslinking agent,

wherein the polyacrylate resin A has a number-average molecular weight Mn of from 1000 to 5000, a ratio of the weight-average molecular weight Mw to the number-average molecular weight Mn of less than 5.0 and an OH number of from 60 to 180 mg of KOH/g, the sum of the proportions by weight of components (a) to (f) always being 100% by weight and the monomers or monomer mixtures employed as component (b) only being those which, on polymerization of the respective monomer alone, produce a polyacrylate and/or polymethacrylate resin having a glass transition temperature of from -10.degree. C. to +6.degree. C. or from +60.degree. C. to 80.degree. C.